

# Colorado Basin Outlook Report June 1, 2013



**This photo of the precipitation can and snow pillow at the Middle Creek SNOTEL site in the headwaters of the Rio Grande basin was taken on 5/29/2013 during the annual summer maintenance visit. Typically, at this time of year, this site would still have 5.6 inches of snow water equivalent on the snow pillow but this season it was completely snow free by 5/19/2013.**

**While many of the SNOTEL sites in northern Colorado are still inaccessible due to late season snow remaining on the ground, most of the SNOTEL sites in the southwest portion of the state have melted out.**

**Photo is courtesy of Mike Ardison, Hydrologic Technician, NRCS Denver, CO.**

# Basin Outlook Reports and Federal - State - Private Cooperative Snow Surveys

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## *How forecasts are made*

Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snow courses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in computerized statistical and simulation models to prepare runoff forecasts. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertain the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

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# Colorado

## Water Supply Outlook Report

### June 1, 2013

#### Summary

Weather patterns established in late April continued during May, with continued storm activity across western and northern Colorado's river basins and persistent dry conditions in the southwest basins. Coupled with the moisture, the northern basins also saw cooler temperatures in May which delayed snowmelt even at the lower elevations. While the strong end to the snow accumulation season has improved water supplies in these basins, temperatures in June will determine runoff rates and how long into summer we will continue to see decent river flows. Conversely, demonstrating Colorado's extremely variable climate, a large portion of the state is still expected to see well below average streamflows this season due to a particularly dry winter.

#### Snowpack

According to SNOTEL data, statewide snowpack totals reached the seasonal maximum this year on April 21<sup>st</sup>, nearly two weeks later than normal. From basin to basin this varied widely; the South Platte basin reached its maximum on May 10<sup>th</sup>, 11 days later than normal, while the combined San Juan, Animas, Dolores and San Miguel basins peaked on March 22<sup>nd</sup>, two weeks earlier than normal. With snow continuing to accumulate in the northern river basins during May, especially in the South Platte basin, the statewide snowpack was 92 percent of median on June 1. Again it is important to note the large disparity between the northern and southern portions of the state. As of June 1, the Colorado basin's snowpack was 108 percent of median, the South Platte was 153 percent of median and the Yampa, White and North Platte basins were 81 percent of median. In contrast the Upper Rio Grande and combined San Juan, Animas, San Miguel and Dolores basins were both at just 2 percent of median. In these basins an early melt out of a well below average snowpack continues to plague water supplies.

#### Precipitation

May was a fairly wet month across most of Colorado. Total precipitation recorded at SNOTEL sites in the state during May was 93 percent of average amounts. Monthly totals were well above average in the South Platte, Arkansas, and Colorado River basins; 125, 102, and 113 percent respectively. It is probably no great surprise that precipitation totals in the southern part of the state were nowhere near normal this past month. May precipitation in the Upper Rio Grande basin was only 58 percent of average and the combined San Juan, Dolores, Animas, and San Juan basins recorded 60 percent of average precipitation for the month. Statewide year to date precipitation was 81 percent of average on June 1 which is 108 percent of last year's totals at this time of year.

#### Reservoir Storage

Colorado's reservoir storage was 78 percent of average at the end of May, and 79 percent of last year's storage at this time of year. Overall statewide storage totals increased by nearly 400,000 acre-feet from last month. However, with cooler temperatures keeping snowmelt in check in the northern part of the state, reservoir inflows during May were below average in most basins. Nearly all basins in Colorado are reporting below average storage, but with the northern basins still holding snow this will change in short order as snowmelt kicks into high gear in the next few weeks.

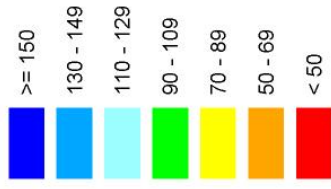
## Streamflow

Additional moisture received during May contributed to moderate increases to streamflow forecasts throughout northern Colorado. Many streams in the Colorado and South Platte River basins are now expected to see above average volumes for the April through July runoff period and in some areas delayed snowmelt has contributed to even higher forecast percentages for the June through July period. With dry conditions persisting throughout May in the southern part of the state, the forecasts for the Upper Rio Grande and the San Juan, Animas, Dolores and San Miguel basins remain well below average for the season. The lowest runoff forecasts continue to be for those streams flowing from the Sangre de Cristo Mountains, on average streams in that region are expected to flow at 28 percent of average from April to September.

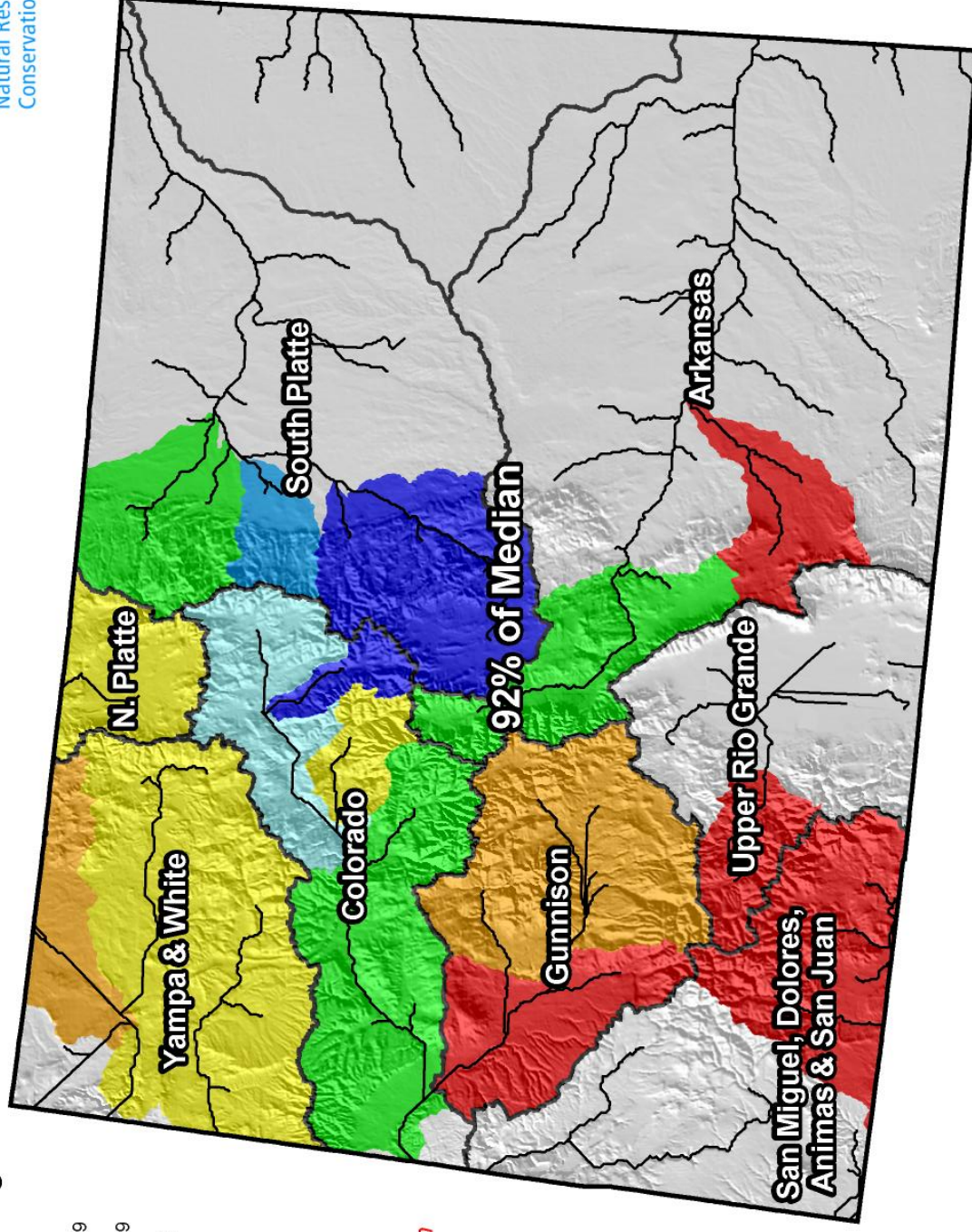


# Colorado Snowpack Map

Percent of Average



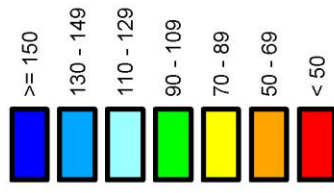
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Subject to Revision*



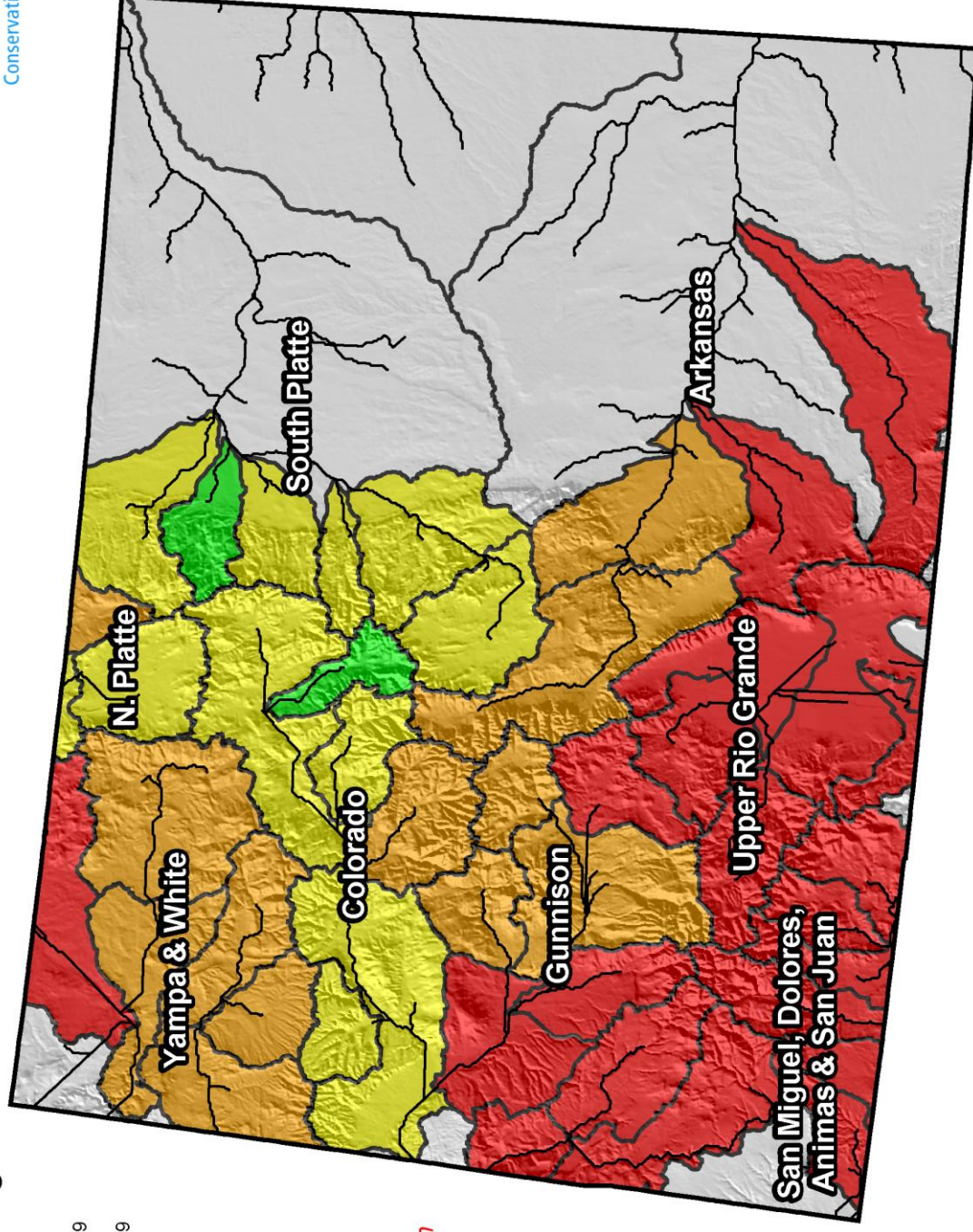
Current as of June 1, 2013

# Colorado Streamflow Forecast Map

## Percent of Average



*Provisional Data  
Subject to Revision*

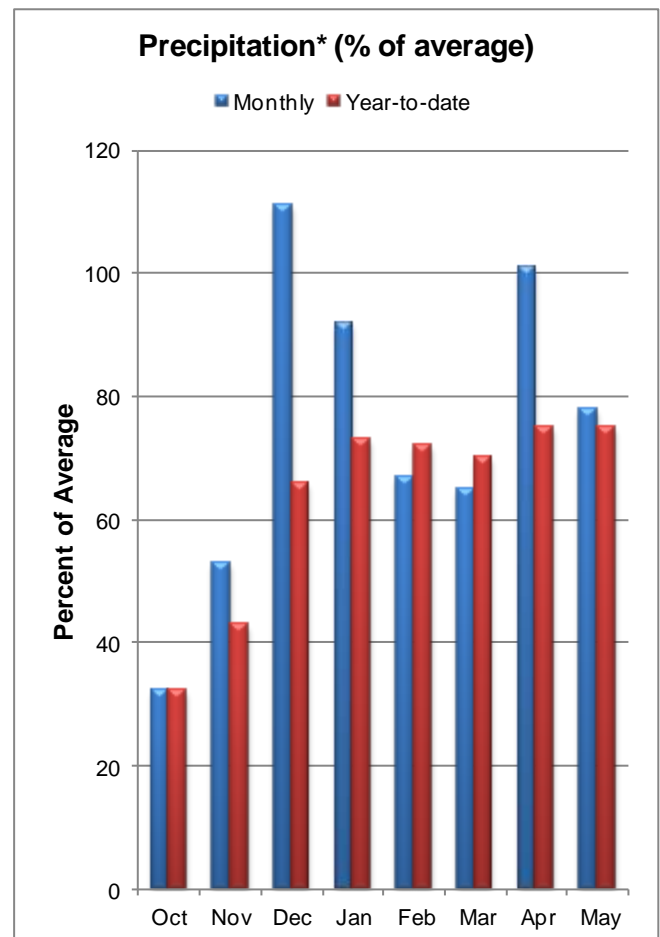
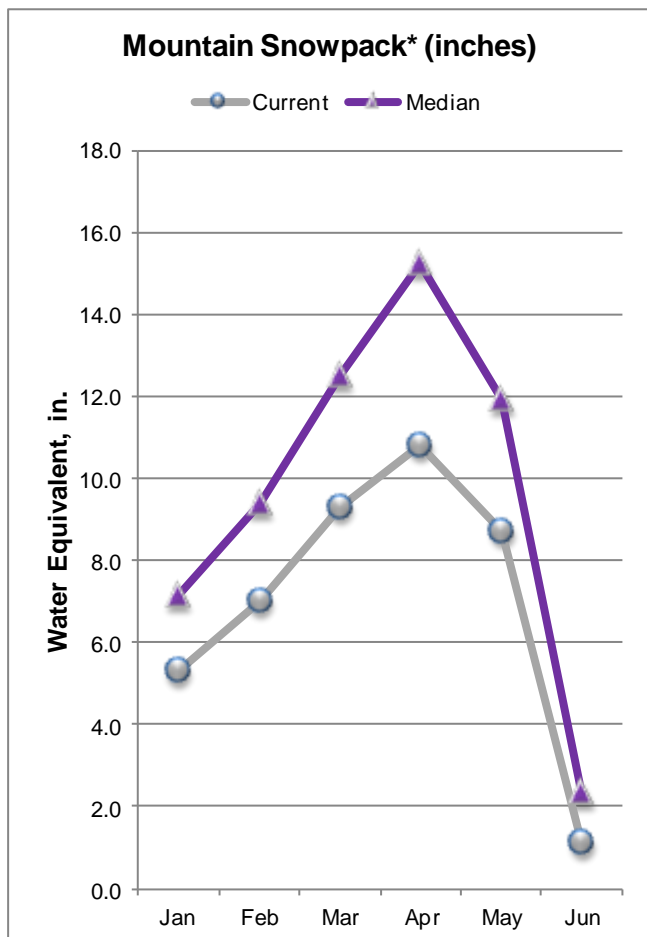


Current as of June 1, 2013



# GUNNISON RIVER BASIN

## as of June 1, 2013



\*Based on selected stations

The snowpack in the Gunnison River basin began to melt in earnest in May, having reached 76 percent of the average peak snowpack on April 21<sup>st</sup>. June 1 snow surveys reported the snowpack to be just 46 percent of the median compared to 73 percent of median reported last month. The Uncompahgre watershed was completely melted out by June 1, according to data from the SNOTEL sites in the sub basin, while the Upper Gunnison and Surface Creek sub-basins reported snowpack's at 59 and 43 percent of median respectively. Mountain precipitation recorded for the month of May was just 78 percent of average in the basin and year to date precipitation totals remain at 75 percent of average as of June 1.

With the snowpack melting, reservoirs in the Gunnison basin have been able to improve their storage volumes over the last month. Total storage amounts increased from 585,000 acre-feet last month to 692,000 acre-feet this month, which equates to 86 percent of the average storage for this time of year. The most recent streamflow forecasts for the Gunnison basin do not deviate much from those issued last month. The expected Inflow to Blue Mesa Reservoir for April to July increased by 3 percentage points this month, it is now expected to flow at 54 percent of average this season. Elsewhere streamflow volumes from June to July are expected to range from 63 percent of average for the Inflow to Taylor Park Reservoir to 32 percent of average for Tomichi Creek at Gunnison.

GUNNISON RIVER BASIN  
Streamflow Forecasts - June 1, 2013

			<<===== Drier =====		Future Conditions		===== Wetter =====>>			
Forecast Point		Forecast Period			Chance Of Exceeding *				30-Yr Avg. (1000AF)	
			90% (1000AF)	70% (1000AF)	50% (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)		
Taylor Park Reservoir Inflow (2)		APR-JUL	54	61	66	67	71	80	99	
		JUN-JUL	27	34	39	63	44	53	62	
Slate R nr Crested Butte		APR-JUL	52	56	59	71	62	67	83	
		JUN-JUL	17.8	22	25	60	28	33	42	
East R at Almont		APR-JUL	98	105	110	60	115	124	182	
		JUN-JUL	48	55	60	57	65	74	106	
Gunnison R nr Gunnison (2)		APR-JUL	171	194	210	57	230	260	370	
		JUN-JUL	85	108	125	58	143	172	215	
Tomichi Ck at Sargents		APR-JUL	12.6	14.6	16.2	54	18.1	21	30	
		JUN-JUL	2.7	4.7	6.3	46	8.2	11.3	13.8	
Cochetopa Ck bl Rock Ck nr Parlin		APR-JUL	4.0	5.1	6.0	40	7.1	9.1	15.0	
		JUN-JUL	0.8	1.9	2.8	39	3.9	5.9	7.2	
Tomichi Ck at Gunnison		APR-JUL	22	26	29	39	33	39	74	
		JUN-JUL	4.9	8.8	12.0	32	15.8	22	37	
Lake Fk at Gateview		APR-JUL	55	62	67	55	73	81	123	
		JUN-JUL	21	28	33	41	39	47	81	
Blue Mesa Reservoir Inflow (2)		APR-JUL	320	345	365	54	380	410	675	
		JUN-JUL	143	169	187	49	205	235	380	
Paonia Reservoir Inflow (2)		MAR-JUN	31	33	37	39	56	83	96	
		JUNE	3.6	5.0	9.0	39	28	55	23	
		APR-JUL	30	32	37	38	53	78	97	
		JUN-JUL	4.4	6.0	11.0	38	27	52	29	
NF Gunnison R nr Somerset (2)		APR-JUL	131	142	150	52	159	174	290	
		JUN-JUL	31	42	50	44	59	74	114	
Surface Ck at Cedaredge		APR-JUL	5.7	6.4	7.0	42	7.6	8.7	16.8	
		JUN-JUL	1.6	2.3	2.9	38	3.5	4.6	7.6	
Ridgway Reservoir Inflow (2)		APR-JUL	40	45	48	48	52	57	101	
		JUN-JUL	20	25	28	43	32	37	65	
Uncompahgre R at Colona (2)		APR-JUL	45	52	58	42	65	75	137	
		JUN-JUL	13.9	21	27	33	34	44	81	
Gunnison R nr Grand Junction (2)		APR-JUL	605	640	670	45	700	745	1480	
		JUN-JUL	210	245	275	40	305	350	695	

GUNNISON RIVER BASIN Reservoir Storage (1000 AF) - End of May					GUNNISON RIVER BASIN Watershed Snowpack Analysis - June 1, 2013			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Median
BLUE MESA	830.0	397.9	526.3	517.1	UPPER GUNNISON BASIN	9	0	59
CRAWFORD	14.0	8.5	9.2	12.6	SURFACE CREEK BASIN	2	0	43
FRUITGROWERS	3.6	3.1	2.8	4.0	UNCOMPAHGRE BASIN	3	0	0
FRUITLAND	9.2	8.4	1.6	6.3	TOTAL GUNNISON RIVER BASIN	12	0	46
MORROW POINT	121.0	112.2	112.3	113.8				
PAONIA	15.4	15.4	15.3	15.7				
RIDGWAY	83.0	72.7	75.1	61.2				
TAYLOR PARK	106.0	73.5	80.5	71.8				

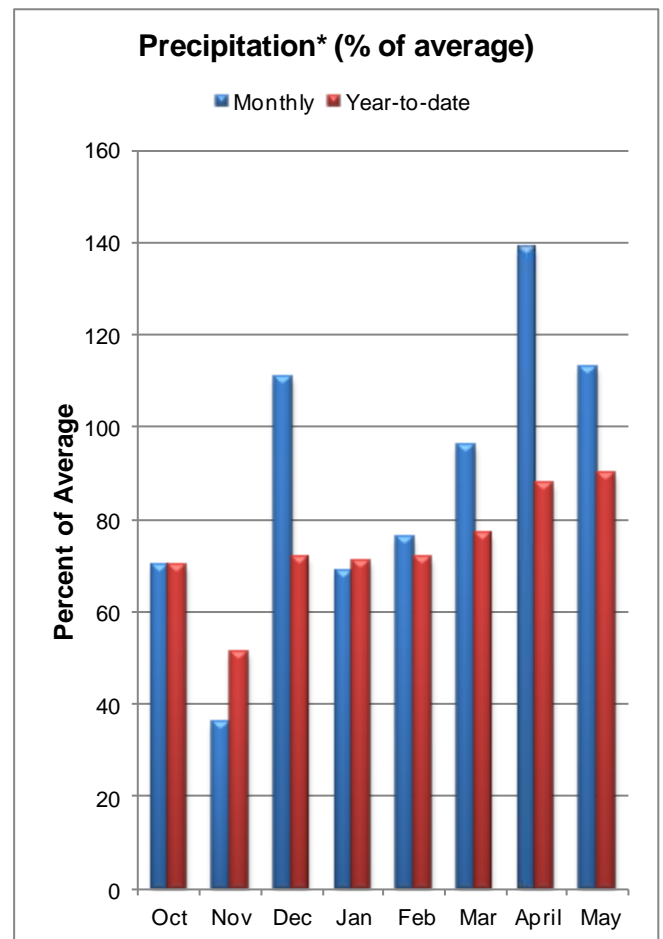
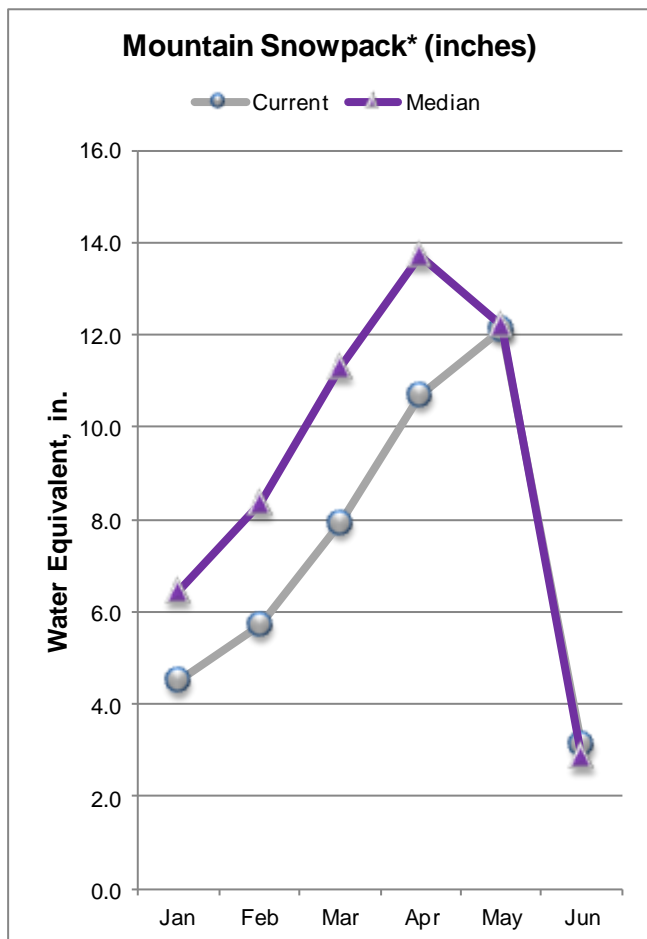
\* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1981-2010 base period, except for the reservoir averages which are from 1971-2000.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural volume - actual volume may be affected by upstream water management.
- (3) - Median value used in place of average.



## UPPER COLORADO RIVER BASIN as of June 1, 2013



\*Based on selected stations

Thanks to cooler temperatures this spring and additional moisture received in the Colorado River basin during May, the snowpack in the basin is above normal for this time of year. As of June 1 the snowpack was at 108 percent of the median, the only month this season to report above normal totals. With its snowpack at just 43 percent of median, the Plateau Creek drainage, just north of the Grand Mesa in western Colorado, was the only sub basin with a below normal snowpack report this month. For the second consecutive month the Colorado basin recorded above average mountain precipitation which has helped boost year to date precipitation totals to 90 percent of average as of June 1.

As of the end of May, reservoir storage in the Colorado basin was at 83 percent of average, up from 67 percent of average reported last month. As temperatures warm up and the higher elevation snow melts off water managers should be able to improve storage in the basin even further. Nearly all streamflow forecasts in the basin have improved again this month. Forecasts for the April to July period are now expected to range from 111 percent of average for the Inflow to Willow Creek Reservoir to 62 percent of average for the Roaring Fork at Glenwood Springs. Inflows to Lake Granby, Willow Creek Reservoir and Green Mountain Reservoir for the remainder of the season (June to July) are now expected to be 92 percent of average.

UPPER COLORADO RIVER BASIN  
Streamflow Forecasts - June 1, 2013

		<<===== Drier =====		Future Conditions =====		===== Wetter =====>>		
Forecast Point	Forecast Period	=====		Chance Of Exceeding *		=====		30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
Lake Granby Inflow (2)	APR-JUL	181	196	205	93	220	235	220
	JUN-JUL	106	121	132	92	144	161	144
Willow Ck Reservoir Inflow (2)	APR-JUL	46	50	52	111	55	59	47
	JUN-JUL	13.7	17.0	19.4	92	22	26	21
Williams Fk bl Williams Fk Reservoir	APR-JUL	79	86	91	94	96	104	97
	JUN-JUL	49	56	61	92	66	74	66
Blue R bl Dillon (2)	APR-JUL	125	136	144	88	152	165	163
	JUN-JUL	81	92	100	91	108	121	110
Blue R bl Green Mountain Reservoir	APR-JUL	215	235	250	91	270	295	275
	JUN-JUL	131	154	170	92	187	215	185
Muddy Ck bl Wolford Mtn Reservoir nr	APR-JUL	35	38	40	74	43	47	54
	JUN-JUL	6.6	9.6	12.0	65	14.6	19.0	18.4
Eagle R bl Gypsum (2)	APR-JUL	189	215	235	70	260	295	335
	JUN-JUL	105	133	153	73	175	210	210
Colorado R nr Dotsero (2)	APR-JUL	1040	1140	1210	86	1290	1400	1400
	JUN-JUL	531	629	700	83	775	892	840
Ruedi Reservoir Inflow (2)	APR-JUL	72	84	93	67	103	119	139
	JUN-JUL	40	52	61	69	71	87	89
Roaring Fk at Glenwood Springs (2)	APR-JUL	370	400	425	62	450	490	690
	JUN-JUL	215	245	270	59	295	335	455
Colorado R nr Cameo (2)	APR-JUL	1520	1660	1760	75	1870	2030	2350
	JUN-JUL	798	938	1040	73	1147	1314	1420

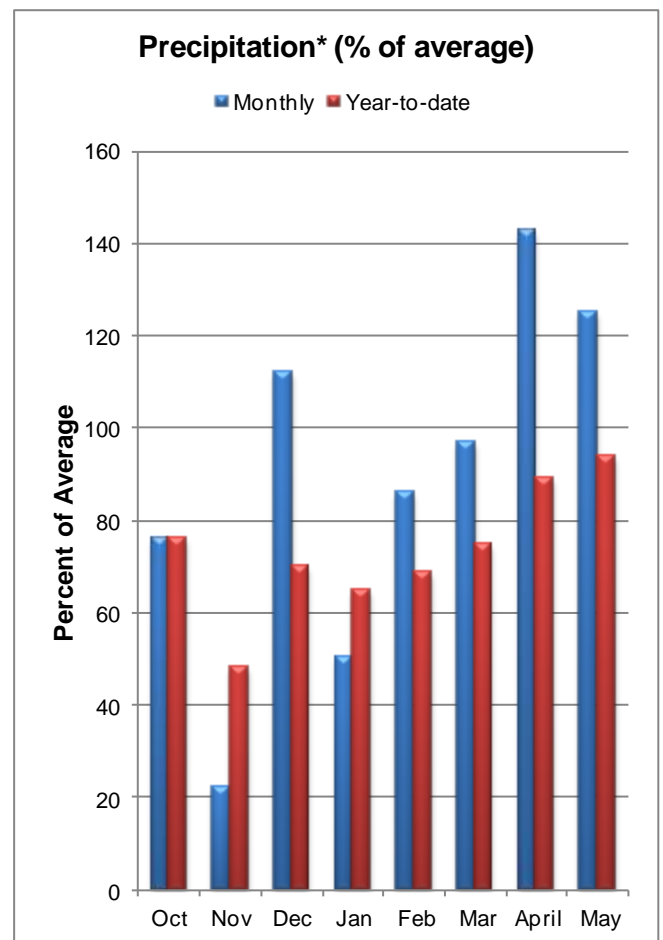
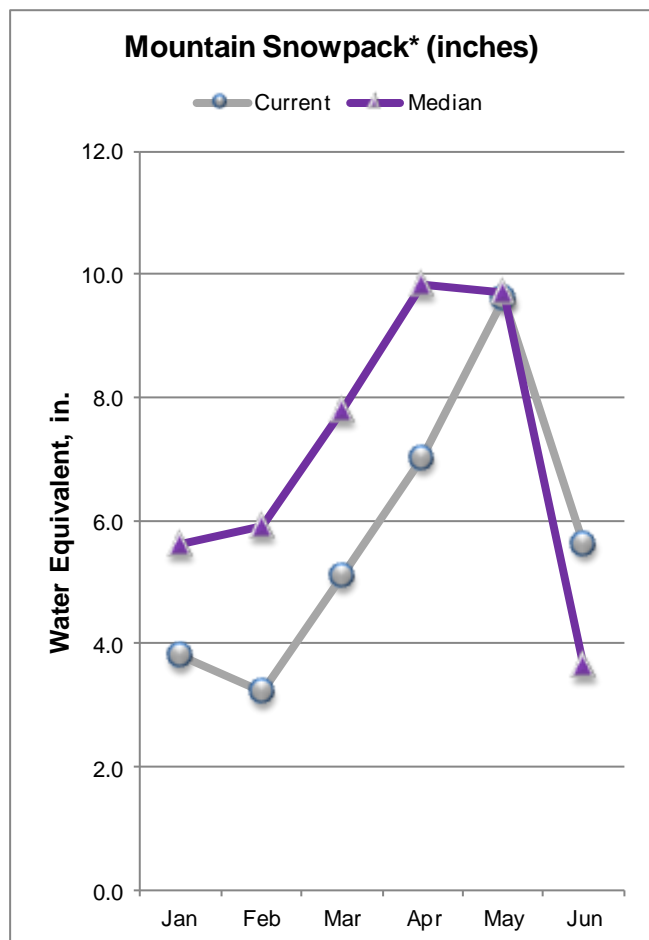
UPPER COLORADO RIVER BASIN Reservoir Storage (1000 AF) - End of May					UPPER COLORADO RIVER BASIN Watershed Snowpack Analysis - June 1, 2013			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Median
DILLON	254.0	193.8	243.1	229.0	BLUE RIVER BASIN	5	2700	178
LAKE GRANBY	465.6	195.7	351.5	302.9	UPPER COLORADO RIVER BASI	14	5747	111
GREEN MOUNTAIN	146.8	87.5	95.0	76.1	MUDDY CREEK BASIN	1	0	0
HOMESTAKE	43.0	5.4	0.3	20.3	PLATEAU CREEK BASIN	2	0	43
RUEDI	102.0	74.6	85.1	74.2	ROARING FORK BASIN	7	0	105
VEGA	32.9	28.2	30.6	29.2	WILLIAMS FORK BASIN	1	0	163
WILLIAMS FORK	97.0	71.1	91.9	63.6	WILLOW CREEK BASIN	2	0	0
WILLOW CREEK	9.1	8.6	7.1	7.4	TOTAL COLORADO RIVER BASI	23	6813	101

\* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1981-2010 base period, except for the reservoir averages which are from 1971-2000.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural volume - actual volume may be affected by upstream water management.
- (3) - Median value used in place of average.

## SOUTH PLATTE RIVER BASIN as of June 1, 2013



\*Based on selected stations

It looked like the snowpack in the South Platte River Basin had reached its peak on May 3<sup>rd</sup> after a series of storms hit the region during the latter part of April. Snowmelt began to get underway and then things switched gears again and the basin received enough snowfall to set a higher, secondary peak on May 10<sup>th</sup>. As of June 1, the South Platte basin's snowpack was at 153 percent of median a welcome effect of all the late season snow and below average spring temperatures. Sub basin snowpack's range from 96 percent of median in the Cache la Poudre watershed to 178 percent of median in the Clear Creek drainage. Year to date precipitation in the basin was 94 percent of average on June 1, and precipitation recorded for May was 125 percent of average.

Reservoir storage in the South Platte basin was at 91 percent of average at the end of May, and 97 percent of last year's storage at this time. With the exception of the Bear Creek forecast points, current forecasts for the South Platte basin improved or remained the same as last months. The forecast for the Inflow to Antero Reservoir had the biggest change and is now expected to see flows that are 101 percent of average for the April to July time period. Elsewhere streamflow volumes are now predicted to range from 106 percent of average for the Inflow to both Spinney Mountain Reservoir and Elevenmile Canyon Reservoir to 71 percent of average for Bear Creek near Morrison.

SOUTH PLATTE RIVER BASIN  
Streamflow Forecasts - June 1, 2013

		<<===== Drier ===== Future Conditions ===== Wetter =====>>						
Forecast Point	Forecast Period	Chance Of Exceeding *						30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (1000AF) (% AVG.)		30% (1000AF)	10% (1000AF)	
Antero Reservoir Inflow (2)	APR-JUL	10.8	13.0	14.6	101	16.4	19.3	14.5
	APR-SEP	12.3	15.4	17.8	100	20	25	17.8
	JUN-JUL	6.2	8.4	10.0	100	11.8	14.7	10.0
	JUN-SEP	7.7	10.8	13.2	100	15.8	20	13.2
Spinney Mountain Res Inflow (2)	APR-JUL	38	45	51	106	57	68	48
	APR-SEP	44	55	64	105	73	89	61
	JUN-JUL	22	29	35	103	41	52	34
	JUN-SEP	28	39	48	104	57	73	46
Elevenmile Canyon Res Inflow (2)	APR-JUL	39	47	53	106	59	70	50
	APR-SEP	46	57	66	103	76	93	64
	JUN-JUL	22	30	36	103	42	53	35
	JUN-SEP	29	40	49	102	59	76	48
Cheesman Lake Inflow (2)	APR-JUL	62	75	86	86	98	117	100
	APR-SEP	73	94	110	87	128	158	126
	JUN-JUL	34	47	58	95	70	89	61
	JUN-SEP	45	66	82	93	100	130	88
South Platte R at South Platte (2)	APR-JUL	104	126	143	79	162	192	180
	APR-SEP	126	160	186	83	215	265	225
	JUN-JUL	59	81	98	93	117	147	106
	JUN-SEP	81	115	141	92	170	220	153
Bear Ck ab Evergreen	APR-JUL	9.0	10.9	12.4	76	14.0	16.7	16.4
	APR-SEP	11.8	14.5	16.6	79	18.9	23	21
	JUN-JUL	4.4	6.3	7.8	89	9.4	12.1	8.8
	JUN-SEP	7.2	9.9	12.0	89	14.3	18.1	13.5
Bear Ck at Morrison	APR-JUL	10.4	13.2	15.5	71	18.2	23	22
	APR-SEP	13.2	17.2	20	71	24	30	28
	JUN-JUL	4.2	7.0	9.3	89	12.0	16.5	10.4
	JUN-SEP	7.0	11.0	14.3	89	18.0	24	16.1
Clear Ck at Golden	APR-JUL	74	84	92	88	100	113	105
	APR-SEP	83	97	107	84	118	135	128
	JUN-JUL	52	62	70	92	78	91	76
	JUN-SEP	61	75	85	85	96	113	100
St. Vrain Ck at Lyons (2)	APR-JUL	69	75	80	91	85	92	88
	APR-SEP	78	87	93	90	100	110	103
	JUN-JUL	36	42	47	81	52	59	58
	JUN-SEP	45	54	60	82	67	77	73
Boulder Ck nr Orodell (2)	APR-JUL	41	44	47	87	50	54	54
	APR-SEP	46	51	54	86	57	63	63
	JUN-JUL	27	30	33	92	36	40	36
	JUN-SEP	32	37	40	89	43	49	45
S Boulder Ck nr Eldorado Springs(2)	APR-JUL	24	29	34	87	39	47	39
	APR-SEP	25	31	37	86	43	53	43
	JUN-JUL	11.3	16.7	21	91	26	34	23
	JUN-SEP	12.3	18.8	24	89	30	40	27
Big Thompson R at Canyon Mouth (2)	APR-JUL	71	79	85	94	91	101	90
	APR-SEP	83	93	101	94	109	122	107
	JUN-JUL	41	49	55	87	61	71	63
	JUN-SEP	53	63	71	89	79	92	80
Cache La Poudre at Canyon Mouth (2)	APR-JUL	161	183	200	89	220	245	225
	APR-SEP	175	200	220	88	240	275	250
	JUN-JUL	85	107	124	87	142	170	143
	JUN-SEP	99	125	145	88	166	200	165

\* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities the actual volume will that exceed the volumes in the table

The streamflow averages are computed for the 1981-2010 base period.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural volume - actual volume may be affected by upstream water management.
- (3) - Median value used in place of average.



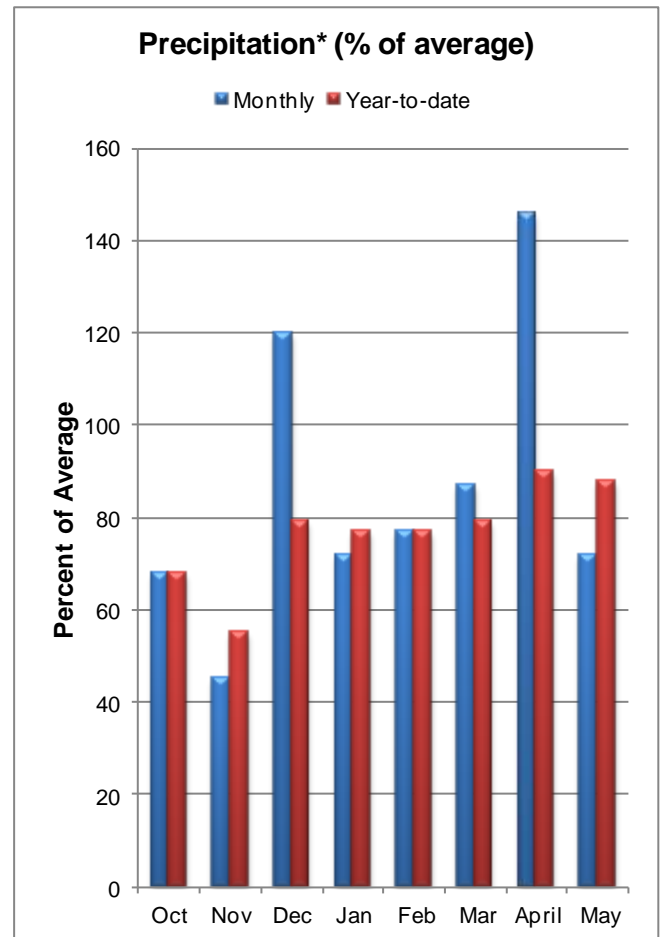
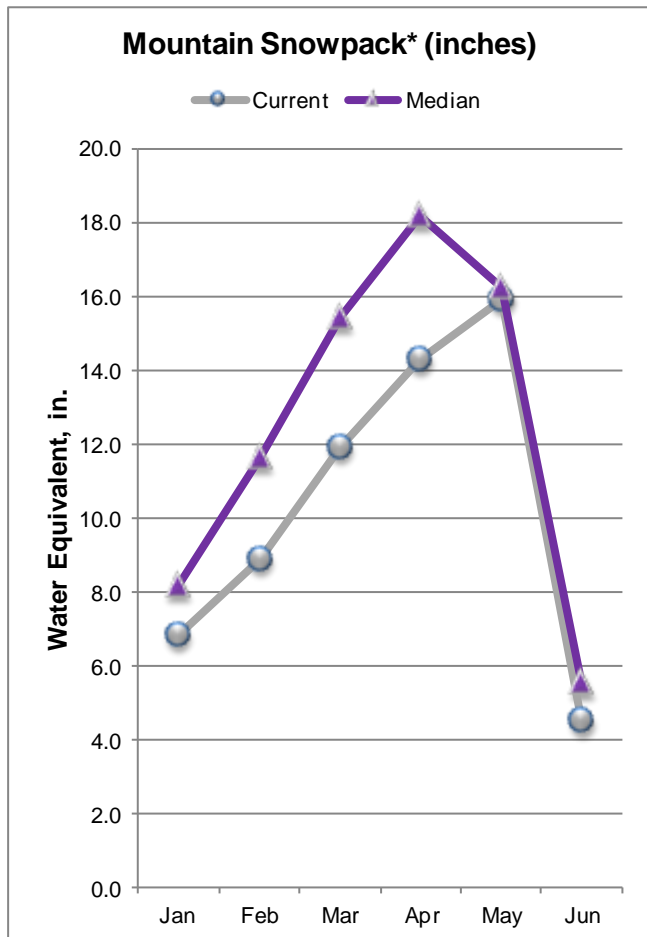
SOUTH PLATTE RIVER BASIN Reservoir Storage (1000 AF) - End of May					SOUTH PLATTE RIVER BASIN Watershed Snowpack Analysis - June 1, 2013			
Reservoir	Usable Capacity	*** This Year	Usable Last Year	Storage Avg	Watershed	Number of Data Sites	This Year as % of Last Yr	% of Median
ANTERO	19.9	17.9	15.8	16.0	BIG THOMPSON BASIN	3	0	104
BARR LAKE	30.1	26.7	23.6	27.7	BOULDER CREEK BASIN	3	310	146
BLACK HOLLOW	6.5	2.9	4.6	4.4	CACHE LA POUFRE BASIN	2	0	96
BOYD LAKE	48.4	21.6	36.9	40.0	CLEAR CREEK BASIN	1	0	163
BUTTON ROCK/RALPH PRICE	16.2	15.4	13.7	14.7	SAINT VRAIN BASIN	1	0	0
CACHE LA POUFRE	10.1	9.8	10.0	9.1	UPPER SOUTH PLATTE BASIN	1	0	1650
CARTER	108.9	94.7	83.2	100.2	TOTAL SOUTH PLATTE BASIN	11	2421	127
CHAMBERS LAKE	8.8	4.9	7.3	5.8				
CHEESMAN	79.0	57.5	71.4	66.2				
COBB LAKE	22.3	11.7	17.9	14.7				
ELEVEN MILE	98.0	97.2	99.9	97.1				
EMPIRE	36.5	30.3	27.9	30.7				
FOSSIL CREEK	11.1	10.7	9.7	8.0				
GROSS	41.8	29.8	34.8	28.8				
HALLIGAN	6.4	6.4	5.2	6.0				
HORSECREEK	14.7	4.6	10.4	14.1				
HORSETOOTH	149.7	119.0	126.3	123.2				
JACKSON	26.1	25.0	25.0	30.6				
JULESBURG	20.5	19.3	19.7	21.5				
LAKE LOVELAND	10.3	9.8	6.8	11.0				
LONE TREE	8.7	8.2	7.8	8.6				
MARIANO	5.4	5.0	3.5	5.4				
MARSHALL		NO REPORT						
MARSTON	13.0	11.5	8.2	15.3				
MILTON	23.5	21.4	18.3	19.3				
POINT OF ROCKS	70.6	62.0	57.0	66.3				
PREWITT	28.2	20.9	20.9	26.7				
RIVERSIDE	55.8	50.0	42.6	56.0				
SPINNEY MOUNTAIN	49.0	28.9	43.4	35.6				
STANDLEY	42.0	36.5	37.7	36.8				
TERRY LAKE	8.0	7.8	7.9	7.0				
UNION	13.0	8.5	11.3	12.2				
WINDSOR	15.2	14.1	11.6	15.0				

The snowpack medians are computed for the 1981-2010 base period and the reservoir averages are for the 1971-2000 base period.

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- (2) - The value is natural volume - actual volume may be affected by upstream water management.
- (3) - Median value used in place of average.



## YAMPA, WHITE, NORTH PLATTE AND LARAMIE RIVER BASINS as of June 1, 2013



\*Based on selected stations

The month of May brought rapid snowmelt to the combined Yampa, White, North Platte and Laramie River basins. By June 1 the snowpack in these basins had fallen to 81 percent of median and just 25 percent of this year's peak snow accumulation total. The sub basins snowpack percentages range from 67 percent of median in the Little Snake drainage to 87 percent of median in the Laramie and North Platte watersheds. Precipitation received in these basins during May was only 72 percent of average amounts for this time of year. Year to date precipitation totals fell from 90 percent of average reported on May 1 to 88 percent of average as of June 1.

Storage volumes in Yamcolo and Stagecoach reservoirs increased again this month. These reservoirs are now storing 92, 000 acre-feet which is 111 percent of the average storage for the end of May. Streamflow forecasts issued this month did not change drastically from those issued last month. Overall the predictions for streamflow volumes this season are a vast improvement over what we saw last year in these basins. June to July streamflow volumes are now expected to range from 76 percent of average for the North Platte River near Northgate to 29 percent of average for Elkhead Creek above Long Gulch. The Yampa River above Stagecoach Reservoir is expected to run at 64 percent of average from June to July.

YAMPA, WHITE, AND NORTH PLATTE RIVER BASINS  
Streamflow Forecasts - June 1, 2013

		<<===== Drier ===== Future Conditions ===== Wetter =====>>							
Forecast Point	Forecast Period	=====		Chance Of Exceeding *		=====		30-Yr Avg. (1000AF)	
		90% (1000AF)	70% (1000AF)	50% (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)		
North Platte R nr Northgate	JUN-JUL	49	75	93	76	111	137	123	
	JUN-SEP	56	88	110	75	132	164	146	
Laramie R nr Woods	JUN-JUL	24	37	46	65	55	68	71	
	JUN-SEP	29	44	54	66	64	79	82	
Yampa R ab Stagecoach Reservoir (2)	APR-JUL	15.3	16.9	18.2	79	19.7	22	23	
	JUN-JUL	2.6	4.2	5.5	64	7.0	9.5	8.6	
Yampa R at Steamboat Springs (2)	APR-JUL	176	193	205	79	220	245	260	
	JUN-JUL	50	67	80	67	94	117	119	
Elk R nr Milner	APR-JUL	200	220	240	75	255	285	320	
	JUN-JUL	67	89	105	66	123	152	159	
Elkhead Ck ab Long Gulch	APR-JUL	36	37	38	52	40	45	73	
	JUN-JUL	0.2	1.4	3.0	29	5.1	9.3	10.4	
Yampa R nr Maybell (2)	APR-JUL	540	585	625	67	665	725	935	
	JUN-JUL	152	199	235	60	275	335	390	
Little Snake R nr Slater (2)	APR-JUL	86	94	100	64	107	118	156	
	JUN-JUL	16.2	24	30	46	37	48	66	
Little Snake R nr Dixon (2)	APR-JUL	121	137	150	44	166	194	345	
	JUN-JUL	16.0	32	45	33	61	89	135	
Little Snake R nr Lily (2)	APR-JUL	113	133	151	44	173	215	345	
	JUN-JUL	15.0	35	53	40	75	116	134	
White R nr Meeker	APR-JUL	136	150	160	57	171	189	280	
	JUN-JUL	46	60	70	49	81	99	144	

YAMPA, WHITE, AND NORTH PLATTE RIVER BASINS Reservoir Storage (1000 AF) - End of May					YAMPA, WHITE, AND NORTH PLATTE RIVER BASINS Watershed Snowpack Analysis - June 1, 2013			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of Last Yr Median	
		This Year	Last Year	Avg				
STAGECOACH	36.4	36.4	33.9	29.9	LARAMIE RIVER BASIN	2	0	86
YAMCOLO	8.7	5.2	0.0	7.7	NORTH PLATTE RIVER BASIN	3	633	74
					TOTAL NORTH PLATTE BASIN	5	734	77
					ELK RIVER BASIN	1	0	0
					YAMPA RIVER BASIN	8	505	81
					WHITE RIVER BASIN	4	4780	85
					TOTAL YAMPA AND WHITE RIV	11	617	75
					LITTLE SNAKE RIVER BASIN	6	388	67
					TOTAL YAMPA, WHITE AND NO	19	765	75

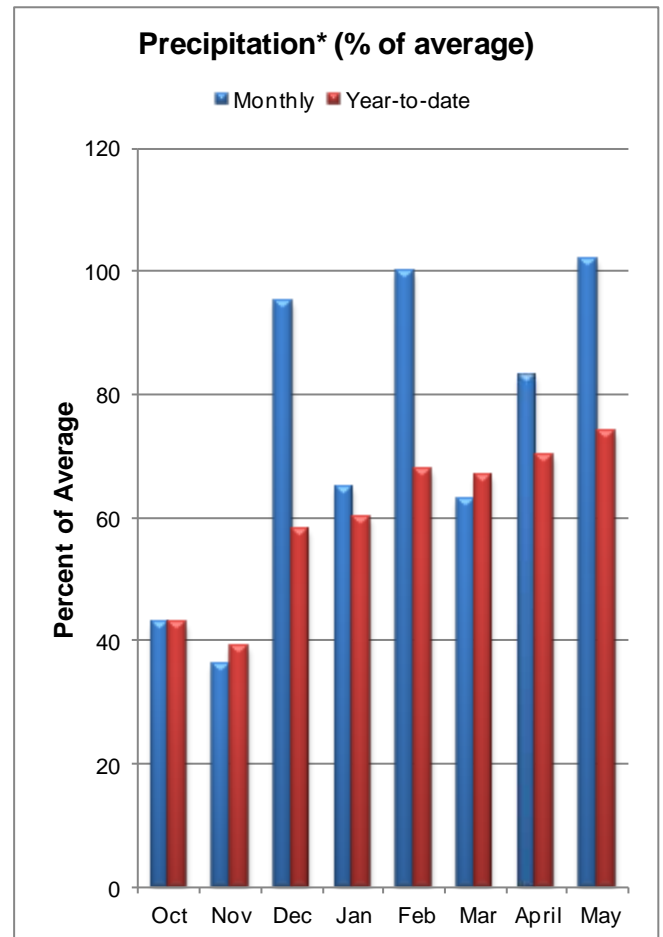
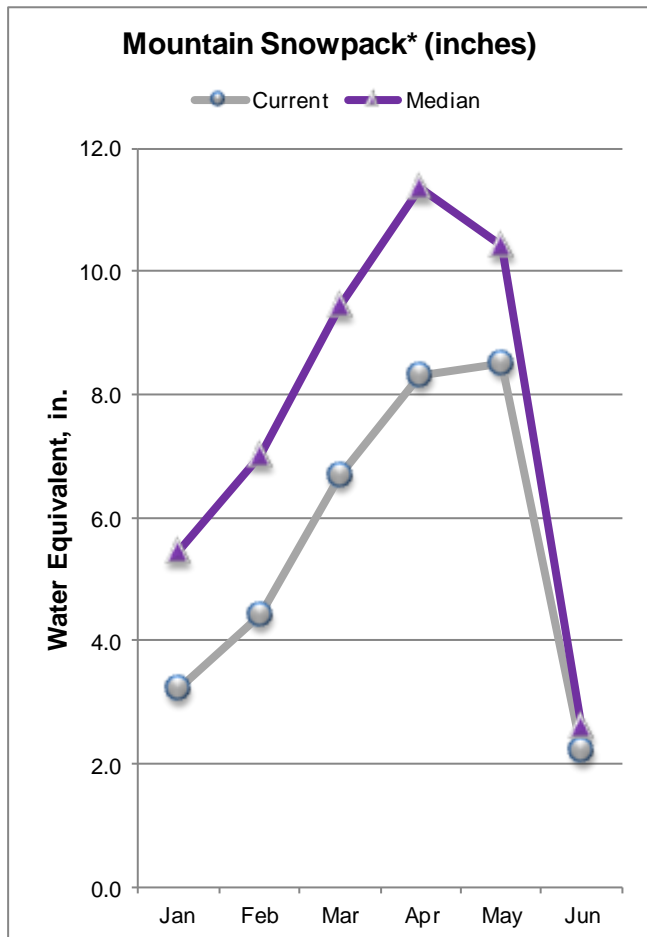
\* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1981-2010 base period, except for the reservoir averages which are from 1971-2000.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.  
 (2) - The value is natural volume - actual volume may be affected by upstream water management.  
 (3) - Median value used in place of average.



# ARKANSAS RIVER BASIN as of June 1, 2013



\*Based on selected stations

As of June 1, the snowpack in the Arkansas River basin was at 86 percent of median. The headwaters portion of the basin is the only area in the larger basin with any snow remaining, the southern tributaries are for the most part completely melted. June 1 measurements show the snowpack in the Upper Arkansas to be near normal at 96 percent of median, while the Cucharas, Huerfano and Purgatoire sub basins had no snow at any of the sites measured. Usually the basin reaches its peak on April 10<sup>th</sup> but storms at the end of April and the beginning of May helped boost the snowpack and extend the snow accumulation season. Since then, the basin has seen below normal temperatures which helped delayed melt in the Upper Arkansas sub basin. May precipitation was 102 percent of average in the basin and 154 percent of last year's May precipitation totals.

Reservoir storage is well below normal in the Arkansas basin, at just 50 percent of average and 63 percent of last year's end of May readings. Fortunately, the Upper Arkansas watershed is still holding snow and hopefully reservoir storage volumes will benefit from the late season runoff. April to September forecasts in the headwaters range from 66 percent of average for the Arkansas River at Salida to 28 percent of average for Grape Creek near Westcliffe. Forecasts for the tributaries range from 55 percent of average for the Huerfano River near Redwing to 26 percent of average for the Purgatoire River at Trinidad.

ARKANSAS RIVER BASIN  
Streamflow Forecasts - June 1, 2013

Forecast Point	Forecast Period	<<===== Drier ===== Future Conditions ===== Wetter =====>>						30-Yr Avg. (1000AF)
		Chance Of Exceeding *						
		90% (1000AF)	70% (1000AF)	50% (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
Chalk Ck nr Nathrop	APR-JUL	8.3	10.7	12.7	61	15.0	18.8	21
	JUN-JUL	3.8	6.2	8.2	50	10.5	14.3	16.3
	APR-SEP	9.1	12.4	15.1	58	18.2	23	26
	JUN-SEP	4.6	7.9	10.6	51	13.7	19.0	21
Arkansas R at Salida (2)	APR-JUL	113	138	158	66	180	215	240
	JUN-JUL	54	79	99	57	121	157	174
	APR-SEP	131	166	195	66	225	280	295
	JUN-SEP	72	107	136	59	166	220	230
Grape Ck nr Westcliffe	APR-JUL	1.7	2.6	3.7	23	5.2	8.2	15.9
	JUN-JUL	0.1	1.0	2.1	25	3.6	6.6	8.3
	APR-SEP	2.2	3.8	5.5	28	7.6	11.6	19.6
	JUN-SEP	0.6	2.2	3.9	33	6.0	10.0	12.0
Arkansas R ab Pueblo (2)	APR-JUL	138	168	192	53	220	265	360
	JUN-JUL	66	96	120	50	147	191	240
	APR-SEP	162	205	240	53	275	340	455
	JUN-SEP	90	134	168	50	205	270	335
Huerfano R nr Redwing	APR-JUL	4.4	5.5	6.4	54	7.4	9.1	11.9
	JUN-JUL	1.9	3.0	3.9	55	4.9	6.6	7.1
	APR-SEP	5.5	7.1	8.3	55	9.7	12.1	15.2
	JUN-SEP	3.0	4.6	5.8	56	7.2	9.6	10.4
Cucharas R nr La Veta	APR-JUL	1.8	2.5	3.0	25	3.6	4.8	12.2
	JUN-JUL	0.8	1.4	2.0	33	2.6	3.8	6.0
	APR-SEP	2.4	3.2	3.9	28	4.6	5.9	14.1
	JUN-SEP	1.4	2.2	2.9	37	3.6	4.9	7.8
Purgatoire R at Trinidad (2)	MAR-JUL	4.1	6.1	7.9	21	10.1	14.2	37
	JUN-JUL	1.2	3.2	5.0	26	7.2	11.3	19.4
	APR-SEP	5.0	8.7	12.0	26	16.0	23	47
	JUN-SEP	3.2	6.9	10.2	33	14.2	21	31

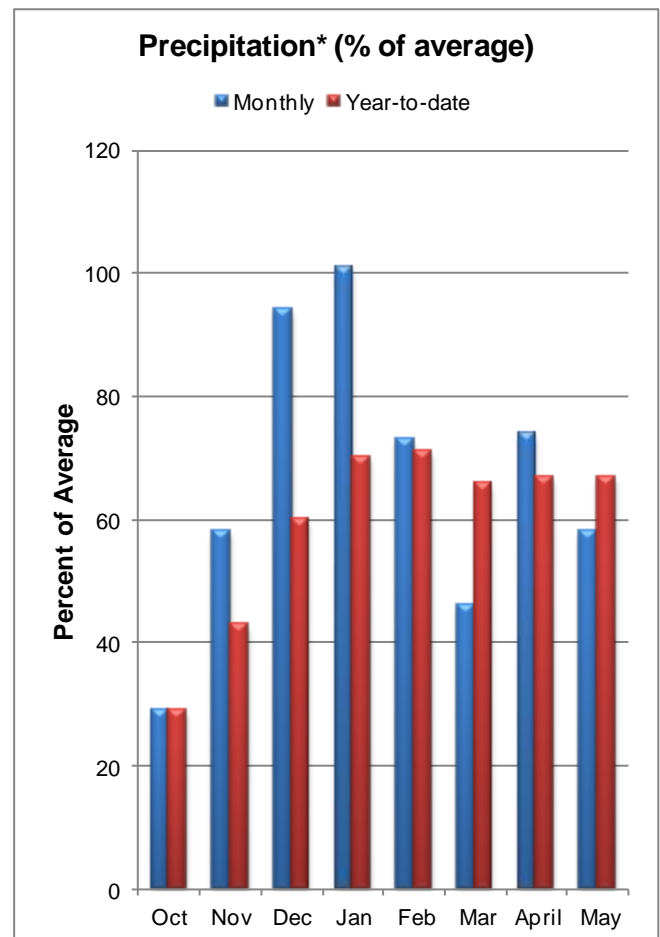
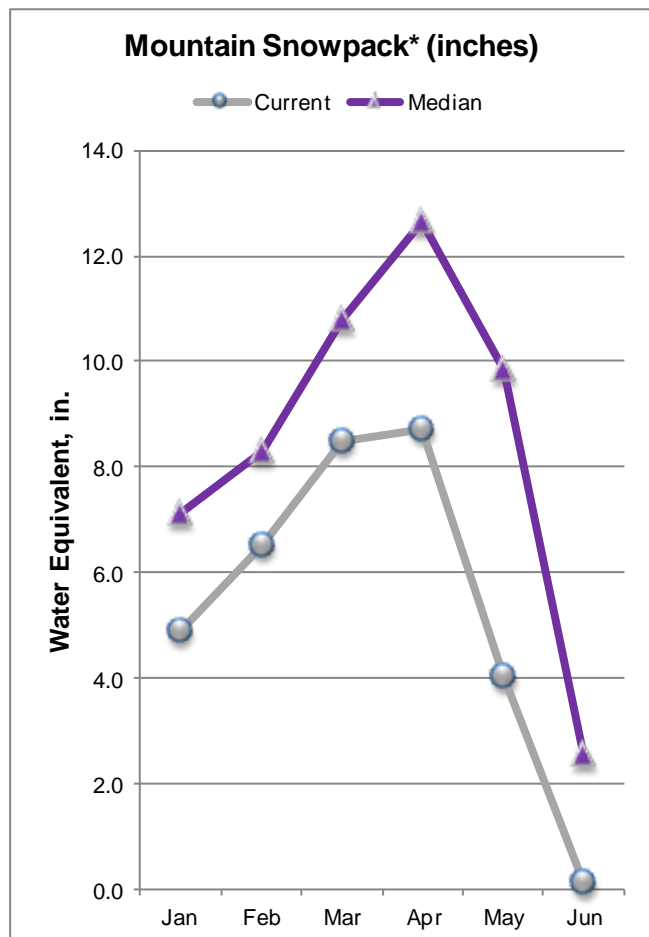
ARKANSAS RIVER BASIN Reservoir Storage (1000 AF) - End of May					ARKANSAS RIVER BASIN Watershed Snowpack Analysis - June 1, 2013			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Median
ADOBE	62.0	6.2	22.1	33.0	UPPER ARKANSAS BASIN	3	1350	96
CLEAR CREEK	11.4	7.1	7.5	6.3	CUCHARAS & HUERFANO RIVER	1	0	0
CUCHARAS RESERVOIR		NO REPORT			PURGATOIRE RIVER BASIN	2	0	0
GREAT PLAINS	150.0	0.0	0.0	39.3	TOTAL ARKANSAS RIVER BASIN	5	1350	96
HOLBROOK	7.0	0.0	0.5	4.1				
HORSE CREEK	27.0	0.0	0.0	10.0				
JOHN MARTIN	616.0	20.5	28.4	128.1				
LAKE HENRY	8.0	0.9	6.4	5.7				
MEREDITH	42.0	9.8	21.6	18.5				
PUEBLO	354.0	147.7	211.9	160.1				
TRINIDAD	167.0	10.6	16.1	29.7				
TURQUOISE	127.0	42.8	81.3	77.6				
TWIN LAKES	86.0	30.5	43.8	42.6				

\* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1981-2010 base period, except for the reservoir averages which are from 1971-2000.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural volume - actual volume may be affected by upstream water management.
- (3) - Median value used in place of average.

## UPPER RIO GRANDE RIVER BASIN as of June 1, 2013



\*Based on selected stations

As has been the case for most of this season, the June 1 snowpack in the Upper Rio Grande was one of the lowest of the major river basins in the state at 2 percent of median. Despite more favorable weather conditions at the end of April, the basin did not pick up enough snow to surpass the peak that was set in mid March. Since that time, the basin has been melting out at a pretty fair pace and as of June 1 only 1 out of the 10 SNOTEL sites in the basin had any snow water content remaining. The Alamosa Creek, Conejos and Rio San Antonio, and Culebra and Trinchera sub basins were completely melted out by mid May. Precipitation totals in the basin for the month of May were only 58 percent of average, and water year to date precipitation remained at 67 percent of average for the second consecutive month.

Reservoir storage is well below average for nearly all of the six reservoirs monitored in the basin. Overall, storage is 40 percent of average and 70 percent of the stored water available at this time last year. The most recent streamflow forecasts call for well below average flows in the upper reaches of the basin with conditions declining further as you move downstream. The hardest hit will be the streams originating in the Sangre de Cristo Mountains. June through September runoff is expected to range from 17 percent of average for Sangre de Cristo Creek to 45 percent of average for Saguache Creek near Saguache.

UPPER RIO GRANDE BASIN  
Streamflow Forecasts - June 1, 2013

		<<===== Drier ===== Future Conditions ===== Wetter =====>>						
Forecast Point	Forecast Period	Chance Of Exceeding *						30-Yr Avg. (1000AF)
		90% (1000AF)	70% (1000AF)	50% (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	
Rio Grande at Thirty Mile Bridge	(2) APR-SEP	54	61	67	52	73	83	129
	JUN-SEP	20	27	33	39	39	49	84
	APR-JUL	50	55	59	52	63	70	113
	JUN-JUL	15.8	21	25	37	29	36	68
Rio Grande at Wagon Wheel Gap	(2) APR-SEP	136	152	165	49	179	200	340
	JUN-SEP	40	56	69	33	83	106	210
SF Rio Grande at South Fork	(2) APR-SEP	50	54	57	45	60	65	127
	JUN-SEP	12.3	16.2	19.1	29	22	27	65
Rio Grande nr Del Norte	(2) APR-SEP	178	205	230	45	255	300	515
	JUN-SEP	40	67	90	30	116	161	305
Saguache Ck nr Saguache	(2) APR-SEP	11.0	13.6	15.7	49	18.1	22	32
	JUN-SEP	4.3	6.9	9.0	45	11.4	15.4	20
Alamosa Ck ab Terrace Reservoir	APR-SEP	20	23	26	38	28	33	68
	JUN-SEP	6.7	9.7	12.0	32	14.6	18.8	38
La Jara Ck nr Capulin	MAR-JUL	2.0	2.3	2.6	29	2.9	3.6	8.9
	JUN-JUL	0.2	0.5	0.8	36	1.2	1.8	2.3
Trinchera Ck ab Turners Ranch	APR-SEP	3.1	3.7	4.2	33	4.7	5.6	12.6
	JUN-SEP	1.6	2.2	2.7	35	3.2	4.1	7.8
Sangre de Cristo Ck	(2) APR-SEP	1.6	1.9	2.3	14	2.8	3.9	16.3
	JUN-SEP	0.1	0.4	0.8	17	1.4	2.5	5.0
Ute Ck nr Fort Garland	APR-SEP	2.7	3.7	4.5	35	5.5	7.2	12.8
	JUN-SEP	0.9	1.9	2.7	34	3.7	5.4	8.0
Platoro Reservoir Inflow	(2) APR-JUL	23	25	27	48	29	32	56
	JUN-JUL	7.0	9.4	11.2	32	13.2	16.4	35
	APR-SEP	24	27	29	47	32	37	62
	JUN-SEP	8.0	11.1	13.6	33	16.3	21	41
Conejos R nr Mogote	(2) APR-SEP	70	80	87	45	95	109	194
	JUN-SEP	21	31	38	34	46	60	112
San Antonio R at Ortiz	APR-SEP	1.9	2.0	2.1	14	2.2	2.5	15.6
	JUN-SEP	0.0	0.1	0.1	11	0.3	0.6	1.3
Los Pinos R nr Ortiz	APR-SEP	18.4	19.4	23	32	29	44	73
	JUN-SEP	0.0	1.1	4.9	20	11.4	26	24
Culebra Ck at San Luis	(2) APR-SEP	3.6	5.6	7.4	32	9.6	13.6	23
	JUN-SEP	1.5	3.5	5.3	36	7.5	11.5	14.9
Costilla Reservoir Inflow	(2) MAR-JUL	2.9	3.2	3.5	32	3.8	4.2	11.1
	JUN-JUL	1.0	1.3	1.6	29	1.8	2.3	5.3
Costilla Ck nr Costilla	(2) MAR-JUL	6.4	6.9	7.4	29	7.9	8.8	26
	JUN-JUL	0.9	1.5	2.0	20	2.5	3.4	9.9

UPPER RIO GRANDE BASIN Reservoir Storage (1000 AF) - End of May					UPPER RIO GRANDE BASIN Watershed Snowpack Analysis - June 1, 2013			
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Median
CONTINENTAL	27.0	8.4	5.1	8.2	ALAMOSA CREEK BASIN	1	0	0
PLATORO	60.0	8.9	19.6	24.5	CONEJOS & RIO SAN ANTONIO	2	0	0
RIO GRANDE	51.0	6.6	10.1	24.2	CULEBRA & TRINCHERA CREEK	2	0	0
SANCHEZ	103.0	6.2	8.8	26.9	UPPER RIO GRANDE BASIN	4	0	2
SANTA MARIA	45.0	6.8	7.4	11.4	TOTAL UPPER RIO GRANDE BA	8	0	2
TERRACE	18.0	4.3	7.6	8.0				

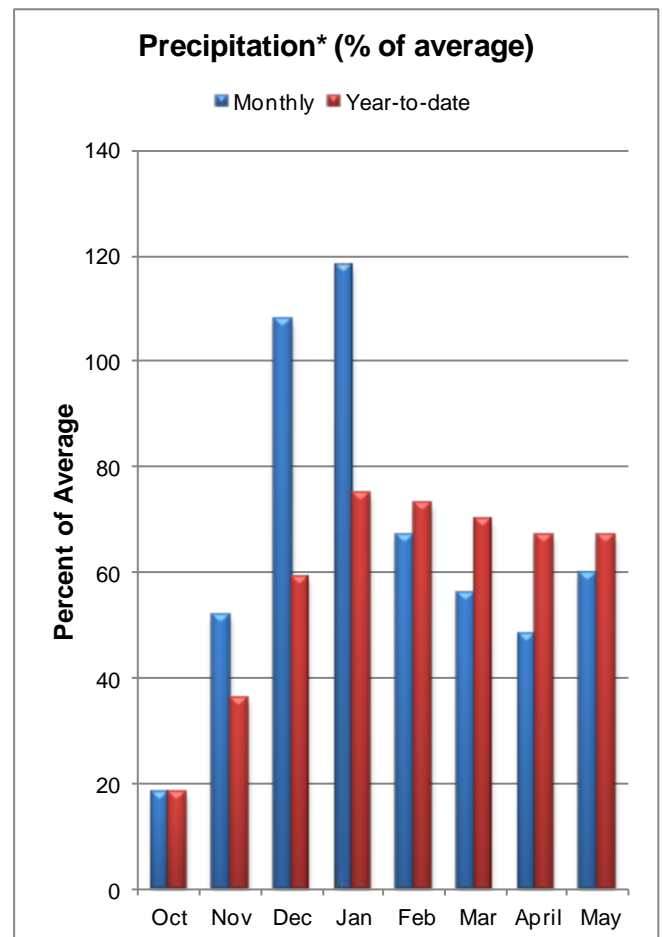
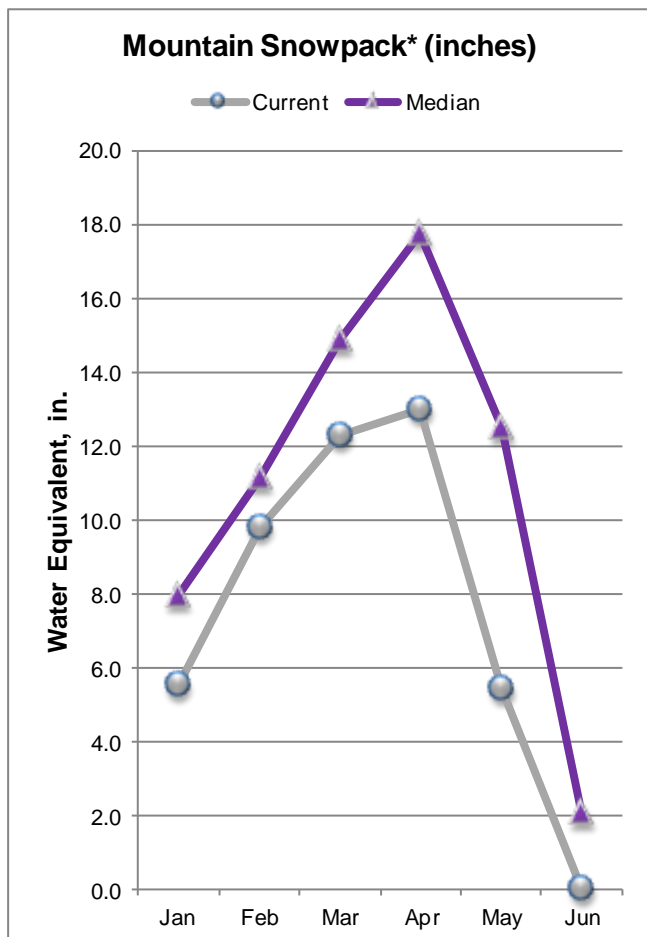
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- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
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## SAN MIGUEL, DOLORES, ANIMAS, AND SAN JUAN RIVER BASINS as of June 1, 2013



\*Based on selected stations

The snowpack in the San Miguel, Dolores, Animas, and San Juan basins has essentially melted out. On June 1, only one SNOTEL site out of 16 in these basins had any measureable snow water equivalent remaining; that site, Wolf Creek Summit, was snow free by June 2. The June 1 snowpack report for these basins came in at just 2 percent of the median for this time of year. Mountain precipitation recorded in these basins during May was 60 of percent average. This is the fourth month in a row to record below average precipitation. Year to date precipitation in the basins was 67 percent of average for the second consecutive month.

As a percent of average, reservoir storage in the basins remained constant this month, at 67 percent of average. The total volume stored did increase slightly as a result of the snowmelt that occurred in May; total volumes at the end of May were 334,000 acre-feet up from 295, 000 acre-feet at the end of April. Forecasts in these basins declined again this month, with the only exception being the Inflow to Navajo Reservoir which increased by 2 percentage points, leaving the April to July forecast at 39 percent of average. Streamflows for the June to July period in these basins are expected to range from 37 percent of average for the Inflow to Vallecito Reservoir to 23 percent of average for the Dolores River at Dolores and the Inlet to Gurley Reservoir.

SAN MIGUEL, DOLORES, ANIMAS, AND SAN JUAN RIVER BASINS  
Streamflow Forecasts - June 1, 2013

Forecast Point	Forecast Period	<<===== Drier =====		Future Conditions		===== Wetter =====>>		30-Yr Avg. (1000AF)
		90%	70%	50%		30%	10%	
		(1000AF)	(1000AF)	(1000AF)	(% AVG.)	(1000AF)	(1000AF)	
Dolores R at Dolores	APR-JUL	73	79	84	34	90	99	245
	JUN-JUL	10.1	16.1	21	23	27	36	92
McPhee Reservoir Inflow (2)	APR-JUL	81	86	91	31	96	104	295
	JUN-JUL	13.6	19.4	24	25	29	37	97
San Miguel R nr Placerville	APR-JUL	47	52	57	45	62	70	128
	JUN-JUL	14.6	20	25	33	30	38	75
Gurley Reservoir Inlet	APR-JUL	4.4	5.9	7.0	43	8.3	10.4	16.4
	JUN-JUL	0.4	0.9	1.3	23	1.8	2.8	5.6
Cone Reservoir Inlet	APR-JUL	0.3	0.8	1.2	40	1.8	3.0	3.0
	JUN-JUL	0.0	0.1	0.3	24	0.5	1.0	1.2
Lilylands Reservoir Inlet	APR-JUL	0.4	0.6	0.8	42	1.0	1.3	1.9
	JUN-JUL	0.1	0.1	0.2	27	0.3	0.5	0.7
Rio Blanco at Blanco Diversion (2)	APR-JUL	19.5	22	24	44	26	30	54
	JUN-JUL	2.6	5.0	7.0	30	9.4	13.5	23
Navajo R at Oso Diversion (2)	APR-JUL	21	24	26	40	29	34	65
	JUN-JUL	3.8	6.6	9.0	30	11.7	16.4	30
San Juan R nr Carracas (2)	APR-JUL	136	148	158	42	169	187	380
	JUN-JUL	26	38	48	30	59	77	158
Piedra R nr Arboles	APR-JUL	91	96	100	48	104	112	210
	JUN-JUL	11.8	17.0	21	28	25	33	74
Vallecito Reservoir Inflow (2)	APR-JUL	91	97	101	52	106	113	194
	JUN-JUL	27	33	37	37	42	49	99
Navajo Reservoir Inflow (2)	APR-JUL	255	270	285	39	300	325	735
	JUN-JUL	30	46	59	20	73	97	290
Animas R at Durango	APR-JUL	156	178	196	47	215	250	415
	JUN-JUL	39	61	79	36	99	133	220
Lemon Reservoir Inflow (2)	APR-JUL	21	23	25	46	27	30	55
	JUN-JUL	4.4	6.5	8.1	30	9.9	13.0	27
La Plata R at Hesperus	APR-JUL	6.6	7.1	7.5	33	8.0	8.8	23
	JUN-JUL	1.0	1.6	2.0	24	2.5	3.3	8.5
Mancos R nr Mancos (2)	APR-JUL	7.5	8.5	9.4	30	10.5	12.5	31
	JUN-JUL	0.7	1.7	2.6	25	3.7	5.7	10.4

SAN MIGUEL, DOLORES, ANIMAS, AND SAN JUAN RIVER BASINS  
Reservoir Storage (1000 AF) - End of May

SAN MIGUEL, DOLORES, ANIMAS, AND SAN JUAN RIVER BASINS  
Watershed Snowpack Analysis - June 1, 2013

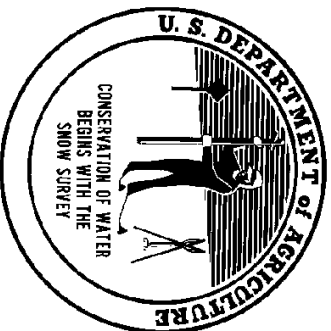
Reservoir	Usable Capacity	*** Usable Storage ***			Watershed	Number of Data Sites	This Year as % of	
		This Year	Last Year	Avg			Last Yr	Median
GROUNDHOG	22.0	10.5	10.1	18.9	ANIMAS RIVER BASIN	6	0	0
JACKSON GULCH	10.0	3.6	8.2	9.3	DOLORES RIVER BASIN	3	0	0
LEMON	40.0	14.7	32.0	29.2	SAN MIGUEL RIVER BASIN	3	0	0
MCPHEE	381.0	215.6	338.2	328.0	SAN JUAN RIVER BASIN	3	0	3
NARRAGUINNEP	19.0	9.3	13.6	17.4	TOTAL SAN MIGUEL, DOLORES	14	0	2
VALLECITO	126.0	80.5	123.9	93.9	AN JUAN RIVER BASINS			

\* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1981-2010 base period, except for the reservoir averages which are from 1971-2000.

- (1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
- (2) - The value is natural volume - actual volume may be affected by upstream water management.
- (3) - Median value used in place of average.





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In addition to the basin outlook reports, water supply forecast information for the Western United States is available from the Natural Resources Conservation Service and the National Weather Service monthly, January through May. The information may be obtained from the Natural Resources Conservation Service web page at <http://www.wcc.nrcs.usda.gov/wsf/westwide.html>

*Issued by*

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*Released by*

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# **Colorado**

## **Basin Outlook Report**

**Natural Resources Conservation Service**  
**Lakewood, CO**